Parenting programmes for preventing tobacco, alcohol or drugs misuse in children under 18: a systematic review

Petrie J, Bunn F, Byrne G

Jane Petrie

Parenting Co-ordinator, Dacorum Primary Health Care Trust, UK

Frances Bunn

Senior Research Fellow in Evidence Based Practice, Centre for Research in Primary and Community Care, University of Hertfordshire, College Lane, Hatfield, AL10 9AB, UK

Geraldine Byrne

Principal Lecturer, School of Nursing and Midwifery, University of Hertfordshire, College Lane, Hatfield, AL10 9AB, UK

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ABSTRACT

We conducted a systematic review of controlled studies of parenting programmes to prevent tobacco, alcohol or drug abuse in children under 18. We searched Cochrane Central Register of Controlled Trials, specialised Register of Cochrane Drugs and Alcohol Group, Pub Med, psych INFO, CINALH, and SIGLE. Two reviewers independently screened studies, extracted data and assessed study quality. Data were collected on actual or intended use of tobacco, alcohol or drugs by child, and associated risk or antecedent behaviours. Due to heterogeneity we did not pool studies in a meta-analysis and instead present a narrative summary of the findings. Twenty studies met our inclusion criteria. Statistically significant self-reported reductions of alcohol use were found in six of 14 studies, of drugs in five of nine studies and tobacco in nine out of 13 studies. Three interventions reported increases of tobacco, drug and alcohol use. We concluded that parenting programmes can be effective in reducing or preventing substance use. The most effective appeared to be those that shared an emphasis on active parental involvement and on developing skills in social competence, self-regulation and parenting. However, more work is needed to investigate further the change processes involved in such interventions and their long-term effectiveness.

INTRODUCTION

Tobacco, alcohol and drug use is a widespread and increasing problem among young people. Recent trends show a growth in heavy drinking with an associated increase of smoking and illegal drug use [1]. One in four deaths of European men aged 15-29 is related to alcohol [2] and an UK survey found that 13% of 11 to 15 year olds smoke regularly [3], and 20% had used illegal drugs in the past year [4].

A number of systematic reviews and meta-analyses have shown parenting programmes to be effective in changing children's behaviour [5-7], reducing time in institutions for juvenile delinquents [8] and improving psycho-social health of mothers [9]. However, behavioural problems are not the only aspect of a child's health that is influenced by their family and home environment. Low parental supervision and monitoring has been found to be a strong predictor of smoking in girls and increased drinking and problem behaviour in boys [10][11]. Expressions of parental disapproval have been demonstrated to be effective deterrents to children smoking [12].

Although we found several systematic reviews of substance use prevention among young people [13-15] none focused on interventions involving parents. A non-systematic overview of drug prevention programmes did, however, find promising effects from family based interventions [16]. In order to clarify the situation we conducted a systematic review to assess whether programmes designed to increase parenting skills can prevent tobacco, alcohol and drug misuse in children and teenagers.

OBJECTIVES

- To assess the effectiveness of parenting programmes in preventing or reducing use, misuse or abuse of drug, alcohol or tobacco by children under the age of 18 years compared to no intervention or other interventions.

METHODS

Inclusion criteria: types of studies

Randomised controlled trials, controlled trials and controlled before/after studies.

Inclusion criteria: participants

Parents with children under 18 years of age. Studies were excluded if they were designed to manage children with established drug, alcohol or smoking habits or focused on parents who were receiving treatment for their own addictions to alcohol or drugs.

Inclusion criteria: intervention

There is ongoing debate as to whether education should be directed towards abstinence or harm reduction [17]. The terms 'abuse', ' use' and 'misuse' often have cultural and social differences in definition and therefore the scope of the review was not limited by imposing an arbitrary distinction between these terms. We relied upon the definitions provided in each identified study and included any parenting programme that aimed to prevent or reduce substance use among young people.

For the purpose of the review we defined 'parenting programmes' as any intervention involving parents which was designed to develop parenting skills, improve parent/child communication or enhance the effects of other interventions e.g. classroom based programmes. We included all types of learning medium e.g. group discussion, distance learning by internet or post, video programme, individual

coaching, etc. and any source of delivery e.g. programmes provided by health visitors or school nurses, programmes run by charities or voluntary organisations etc. Interventions where there was minimal contact with parents (e.g. leaflets only) were not considered to constitute a 'programme' and were therefore excluded.

The comparisons of interest were:

- Parenting programme versus no programme,
- Parenting programme versus other type of intervention such as school or community based programme

Inclusion criteria: outcomes

Studies had to include an objective or self-reported measure of at least one of the following;

- smoking, drinking or drug use by child
- intention of child to participate in smoking, drinking or using drugs
- alcohol and drug related risk behaviours in child such as criminal offending, antisocial behaviour, risky sexual behaviour
- antecedent behaviours such as truancy, conduct disorders or poor academic performance

Identification of studies

We searched for published and unpublished studies using the following databases: CCTR (Cochrane Central Register of Controlled Trials) Cochrane Library Issue 4 2003, Specialised Register of Cochrane Drugs and Alcohol Group, Pub Med 1960-October 2003, psych INFO 1978-October 2003, CINALH 1982-October 2003, SIGLE 1980-October 2003, UK Department of Health National Research Register 2000-

October 2003. For search terms used see Box 1. We checked reference lists and contacted experts in the field. There were no date or language restrictions.

Data extraction and analysis

Two reviewers independently examined the title and abstract of citations identified by the electronic search, applied the selection criteria to the study reports, extracted data and assessed study quality. Data was extracted on methodological quality of studies, type of participants, outcomes, intervention and length of follow up. Data extracted on the intervention included type and duration of programme, setting and training of staff delivering the programme.

Methodological criteria for randomised and controlled trials was allocation concealment (A = adequate, B = unclear, C = inadequate), baseline measurement of outcome, blinded assessment of primary outcome(s), follow-up (were 80% or more of participants followed-up?), protection against contamination (is there a description of allocation methods and is it likely the control group received the intervention?), intention to treat analysis, and unit of allocation and analysis. For non randomised studies we assessed whether there was an appropriate choice of control site, baseline measurement of primary outcome, blinded assessment of primary outcome, adequate follow up and protection against contamination. Quality assessment details for randomised controlled trials are reported in table II and for non-randomised studies in table III. While summary scores for quality need to be used with some caution [18] they can be useful when interpreting results. Therefore, quality scores are reported alongside effectiveness in table IV.

Due to heterogeneity in study design, interventions and outcome, we did not pool studies in a meta-analysis. Instead a narrative and tabular summary of findings is presented and an assessment made on the quality, size of the effect observed and

statistical significance of the studies. In many of the trials the unit of allocation and analysis was different. Participants were allocated at group level, (school, class or family) and analysed at individual level. While it is beyond the scope of this systematic review to reassess each set of results in the light of unit of analysis errors, we have documented them and highlight associated problems.

RESULTS

Initial searches generated 1,617 articles. Of these, 122 were identified as potentially relevant and full texts were obtained. Forty-six reports on 20 studies met our inclusion criteria. Sixteen were RCT's, [19-34] three CBAs [35-37] and one a controlled trial [38].

Studies took place almost exclusively in the USA, apart from one Russian study [34], one Australian [37] and one Norwegian [23]. However, the Russian study was an off shoot of the USA study, Project Northland [27]. The format of the parenting intervention varied widely between studies. They included parenting skills training in groups [20][22][24][26][28][30-31][36][38], homework tasks requiring parental participation [27][34-35], mailed booklets [19][21][29], home visiting [25], and a mixture of these approaches [21][23][32-33][37]. Most subscribed to social or behavioural learning models, teaching communication skills, reinforcing refusal skills and developing boundary setting and problem solving approaches.

Five studies focused on alcohol [25-27][33-34], five on tobacco [21][23][29][31][37] and the remainder on a combination of substance misuse behaviours. Length of follow up varied widely, ranging from one [34] to twelve years [38]. Five studies took place in rural areas [26-27][30-31][36] whilst the rest targeted urban or mixed urban and rural areas. Many were in places with high levels of economic deprivation [26-

27][30-31][33][38]. For more information on individual studies see Table I. For information on study quality see Tables II & III.

The interventions could be grouped into three categories, studies that:

1. identified and addressed pre-cursor behaviour in primary school pupils where parent and teacher relationships have maximum influence on children.
2. focused on transition between primary and secondary school when expectations, boundaries and opportunities change dramatically for children and peer pressure begins to dominate.
3. concentrated on adolescents, their emerging independence and ability to make choices among peer and community influences.

The results are, therefore, organised into these three categories and an overall summary of effect is presented in table IV.

Primary School

Four studies involved primary school children aged 5 to 11 years[21][25][32][38].

One study [38],the 'Preparing For The Drug Free Years' programme, looked at the effect of behaviour management training for teachers and parents and social skills training for children on tobacco, alcohol and drug use. The study included a longitudinal follow-up, reporting on student's drug, alcohol and cigarette consumption at graduation. They found no significant difference in substance use between the intervention and control groups ($p=0.93$) although the intervention group had better academic achievement ($p=.01$), less school misbehaviour ($p=.02$) and reported fewer violent delinquent acts ($p=.04$).

Two studies [21][32] focused on preventing tobacco use. In one, the 'Family-School Partnership' [32] a class-based intervention was compared with a parent and school

based intervention and a control group. After adjusting for sociodemographics and baseline covariates they found, at 6 year follow up, a significant reduction in the risk of smoking in both intervention groups compared to the control group (class centred programme RR 0.57 (95% CI 0.34, 0.96), family-centred programme RR 0.69 (95% CI 0.57, 0.97) but no significant advantage for either intervention against the other. Non adjusted results were not significant. The other [21] 'Smoke Free Kids' programme also found a significant reduction in children's intention to smoke (OR 0.60 95% CI 0.37, 0.95).

One programme was designed to prevent children misusing alcohol [25]. The study, which included home based facilitator led sessions, information and support, showed a significant reduction in alcohol use ($p<.001$) and misuse ($p<.05$) for those children who had no prior use of alcohol but a significant increase in the use and misuse of alcohol by children who had already commenced drinking at the time of the intervention (4% increase).

Transition from primary to Secondary school:

Eight studies targeted children at the change from primary (elementary) to secondary (middle and high school) education [22][24][26][30][33-35][37].

Three [22][30][35] focused on tobacco, alcohol and drug use. One [22], 'The Midwestern Prevention Programme', was a 12-month programme involving homework designed to engage parents in reinforcing abstinence messages with their children. The study found a significant reduction in tobacco and marijuana use in the intervention group and a non-significant reduction in alcohol use (difference in absolute change from baseline, tobacco: 5.5%, marijuana 9%, alcohol: 3.1%,). One [35] entitled 'Project Star' was a classroom intervention that also included homework activities involving parents. The study found significant reductions for alcohol,

cigarette and marijuana use among the intervention group compared to the control (change in proportion of use in last month between intervention and control, alcohol: difference 5.2%; tobacco: difference 9.7%; marijuana: difference 3.7%). The other The Iowa Strengthening Families Programme [30], which involved seven parent and child sessions, also found significant reductions in alcohol, drug and tobacco use, with a 21% difference between intervention and control in those who had ever used alcohol.

Another study [24] the 'Coping Power Program' focused on children with aggressive behavioural problems who were considered to be at risk of later substance misuse and social exclusion. They found that group based parenting skills training alone (indicated) or alongside the classroom programme (universal with indicated) had a significant effect on drug and alcohol scores compared with the control (indicated -0.01, indicated with universal -0.01, control +0.10). The classroom only programme (universal) had no significant effect on reducing delinquency and substance misuse one year after the intervention (0.00).

Three [26][33-34] focused on alcohol use only. Preparing for the Drug Free Years Programme [26] involved five group sessions for parents of children aged 11 to 13 years, and found a significant reduction in alcohol use. At 3.5 year follow up initiation of use was 13% less and use in past month was 16% less in the intervention group than the control. The Russian-American Partnership for Prevention study [34], including homework sessions and parent handbook, showed a non significant effect in reducing initiation or experimentation with alcohol (use in past year17.9% versus 20% p=0.67).

The other was a study of an alcohol prevention programme involving booklet based parenting education ('Stars For Families') [33]. The authors reported results for two

types of schools separately. A reduction in mean alcohol use was found in both types of schools but it was only statistically significant in one (magnet school p <0.05).

One study [37]entitled 'Kickbutts' aimed to prevent tobacco use. They compared a school and parenting intervention with the standard school curriculum. The parenting intervention included information and workshops. They found no difference between the intervention and control group (change from baseline 9% versus 8.7%).

Adolescent programmes:

Eight studies looked at interventions with teenage children and their parents [19-20][23][27-29][31][36]

Three studies [20][27-28] focussed on drugs, tobacco and alcohol use. Project SCOPE [20] evaluated coping skills training. They compared three groups, a classroom-based programme, a classroom-based programme with additional parenting programme and a control. At the two-year follow up, the classroom only programme showed effective results, but those with both parenting and classroom intervention showed an increase in use of drugs and alcohol. One study [28] compared the established classroom programme of school based sessions (DARE) with an additional parenting programme involving homework tasks (DARE Plus). Outcome data for girls and boys were reported separately. The study found no significant differences in the girls' substance use scores. For the boys, scores were lower in the DARE and DARE Plus groups when compared to control (but this was only statistically significant in the DARE Plus group). The other [31] compared a parenting programme (Life Skills Training with Strengthening Families Programme), involving evening sessions for children and their parents, with a classroom only intervention (Life Skills Training) and a standard school curriculum control group.

There was a relative reduction in numbers of new users of tobacco, alcohol and marijuana in both intervention groups compared with the control. However, reductions were higher in the parenting programme (LST with SFP) than the classroom only intervention (LST) (relative reduction rate in number of new users - alcohol LST with SFP 30%, LST 4%; tobacco, LST with SFP 28%, LST 14%; marijuana LST with SFP 48%, LST 46%) .

The New Hampshire study [36] looked at use of drugs and chewing tobacco in adolescents. They compared three groups: a classroom based intervention, a classroom intervention with additional ten-session parent communication course, and a control. There was a reduction in initiation and regular use of marijuana in both intervention groups, which was greater in the parenting group, but this was not statistically significant in either (classroom intervention: initiation RR 0.95 (95% CI 0.67, 1.35), regular use RR 0.84 (95% CI 0.51, 1.36), parenting programme: initiation RR 0.74 (95% CI 0.48, 1.14), regular use RR 0.56 (95% CI 0.29, 1.08)).

The 'Family Matters' study [19] evaluated the effect on alcohol and tobacco use of a series of booklets for parents of children aged 12-14 years. At one-year follow they found a significant reduction in smoking onset (16.4%, OR 1.30, p=0.037) and a non significant reduction in alcohol use (5%, OR 1.26, p=0.1).

Two studies [23][29] looked at tobacco use only. One 'BEsmokeFREE' [23] was a three-year intervention in 99 Norwegian secondary schools with pupils 12 to 14 years of age. The full programme included teacher training, classroom curriculum, information leaflets for parents about communication with adolescents, a parent-teacher interview and a non-smoking contract with the child. At one year follow up they found a significant reduction in the average number of cigarettes smoked per week by children experiencing the full intervention programme (full intervention 10,

control 17). The programme was found to be less effective when teacher training or parent involvement was omitted (teacher training only 13, parent programme only 14). The other study [29] targeted the use of smokeless tobacco and cigarettes by children in early to mid adolescence. They compared a classroom only intervention with classroom and parent component (mailed booklets) and a control. Both interventions showed a significant reduction in the number of children using smokeless tobacco but an increase in the number of children smoking cigarettes (increase in mean number of cigarettes per month from baseline to post test at year 10: control 16.7, intervention 34). The study found no significant link between parental involvement and outcome.

The Project Northland study [27] targeted alcohol use only. They compared an alcohol prevention programme, classroom activities supported by parental involvement, and standard classroom curriculum. The intervention ran from grade 6 to grade 12 (graduation). The study found growth rates for alcohol use in the intervention group were nearly half that of the control group (1.44 versus 2.11). However, in Grade 10, an interim year in which no intervention occurred, rates of alcohol use increased rapidly amongst the intervention group.

DISCUSSION

This systematic review has examined the effectiveness of parenting programmes in reducing tobacco, alcohol and drug misuse in children under 18 years. The quality of the studies and nature of the interventions varied considerably, making assessment of the empirical literature difficult. In general methodological quality of included studies was fair. However, only three reported adequate allocation concealment [19][23][24], in the rest it was unclear. Although poorly concealed trials may introduce selection bias and inflate treatment effect all three trials with good allocation concealment showed significant positive effects. Other methodological

problems included, inappropriate analysis for the unit of allocation which may overestimate significance of differences, high losses to follow-up, poor reporting of results, and contamination. The scope of the review was also broad, including alcohol, tobacco and drug use in a wide age range of young people and involving a diverse range of study types, settings and interventions. This heterogeneity meant meta-analysis was inappropriate and makes meaningful comparisons between studies difficult. In addition, although a number of studies demonstrated statistically significant results this does not always correlate with clinical meaningfulness. Nevertheless, the evidence suggests that parenting programmes can be effective in reducing substance misuse in children.

The strongest evidence found in the review was based on work that had been undertaken with pre-teen and early adolescent children. Seven of the studies [19][22-24][26][30-31] that were of good or fair quality (see Table IV), being well designed and conducted RCTs, had focussed on this group. Each of these studies reports that the parenting programme evaluated led to a significant reduction in one or more of the outcome variables measured, in particular the use of alcohol [24][[26][30-31], drugs [22][24][31] or tobacco [19][22-24][31], compared to controls.

Three of these studies [26] [30-31] examined two specific interventions; the Iowa Strengthening Families Programme and the Preparing for the Drug Free Years programme. Both of these interventions were found to be effective in reducing substance misuse in pre-teen and early adolescent children, although in one study [31] life skills training was found to be as effective as an intervention that included life skills training in conjunction with the Iowa Strengthening Families Programme. A key feature of the three interventions found to be effective was that they focussed on developing strategies to involve adolescents in family activities, maintain good familial bonds and manage conflict, rather than just focusing on the issue of

substance misuse. A second shared feature was an emphasis on parental engagement in an activity based programme. Although brief, 5 – 7 weeks duration, the three interventions required parents to be active participants in group exercises. In addition, in these studies parents demonstrated considerable commitment to the programme, with at least 61% attending all sessions in studies [26] and [30] and more than 89% attending 50% or more of sessions in study [31].

Although these three studies were all school-based, the parenting programmes could have taken place in a number of settings, such as health or community centres. Two other well conducted RCTs [22][24] found collaborative school-parent programmes were also effective in reducing substance misuse for pre-teen and early adolescent children. Although different parenting programmes were evaluated, like the Iowa Strengthening Families Programme and the Preparing for the Drug Free Years programme, the effective interventions shared an emphasis on active parental involvement and on developing skills in social competence, self-regulation and parenting, rather than focussing exclusively on substances and substance use. A further study [28] also found that interactive sessions which focussed on social skills, with active parental involvement, were effective in reducing substance misuse for boys. Although the latter study had some methodological limitations, the sample size was much larger than any of the other studies, providing additional support for the value of interventions involving active parental involvement and focussing on social skills.

Interventions with 11 – 14 year olds that were more specifically school-based were found to be effective in two high quality RCTs[19][23]. These studies each found the intervention groups showed a significant reduction in substance use, compared to controls. Once again, a characteristic of the successful interventions was a focus on developing social skills and sense of personal responsibility among the young

people. Although the interventions were primarily school-based, the homework tasks in two studies [19][35] also involved active parental participation and there was direct communication with parents, either face-to-face [19][23] or by telephone [35]. Active parental involvement, therefore, appears to be an important feature of successful interventions. The interventions that were found to be least effective did not include this. Thus, studies evaluating a school-based intervention supplemented only with mailed information to parents found no significant differences between intervention and control groups [34] or an increase in the targeted behaviour [29], although it must be acknowledged these studies were also weak in terms of methodological quality (see Table IV).

Implications for Practice and Research

Many of the studies reviewed had complex interventions of which a parenting programme was only one component. It was difficult, therefore, to evaluate the effectiveness of one particular aspect of the intervention. The most effective interventions in reducing substance misuse among children under 18 appeared to be those that,

a) emphasised development of social skills and sense of personal responsibility among young people, as well as addressing issues related to substance use, and
b) included active parental involvement.

The broad-based nature of such interventions, targeting social and behavioural factors, and active participation of children and parents appears more important than whether the intervention was targeted specifically at parents, was school-based, or involved collaboration between school and home. However, more work is needed to investigate further the change processes involved in such interventions and their relationships to outcome variables. Levels of participation in the parenting programmes was problematic in several studies. Programmes need to be sensitive

to the needs of parents in order to ensure their motivation. The long-term effect of parenting programmes must also be considered.

An important issue in designing programmes is to identify the best time to deliver the intervention. The transition from primary to secondary school appeared to be an effective time to intervene. Six of the seven studies focusing on this age group reported improvements in outcomes, with differences reaching statistical significance in five [26][35][30][22][24].

Few studies distinguished between children who were regular or occasional users. More work is needed to assess the effectiveness of interventions to prevent the development of regular use in experimental or occasional users. In addition, a large number of studies relied on self-reported measures of substance use and it is highly possible that children under or over-reported their intake. Use of more rigorous, independent, measures would allow more accurate appraisal of the effectiveness of interventions. Finally, most of the studies were conducted in the USA and included two parent families. Further research is needed to assess the applicability of these findings to other social groups.

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Box 1. Search terms used

1. parents OR parenting OR parent-child relations

2. education, or voluntary programmes OR programmed instruction OR communication OR program*

3. substance related disorders (MeSH exploded) OR substance abuse, OR smoking OR tobacco OR marijuana OR smoking cessation (MeSH exploded) OR alcohol-related disorders OR alcohol OR drinking

4. clinical trial Or controlled clinical trial OR intervention studies OR control groups OR random allocation OR comparative study OR evaluation study OR programme evaluation

5. attention deficit disorder with hyperactivity OR attention deficit and disruptive behaviour disorders OR autistic disorder OR schizophrenia OR epilepsy

Example: Cochrane Library Search: (1) AND (2) AND (3) AND (4) NOT (5)

Table I - Table of Included studies

Study ID and methods	Participants and provider	Focus and duration of intervention	Intervention	Duration of intervention	Main outcomes
Primary					
Hawkins 1999 [38] CCT Country: USA	643 children (Grade 1= aged 6-7 yrs, Grade 5 = age 10-11yrs) Provider: Not disclosed	Drugs, alcohol and tobacco	PREPARING FOR THE DRUG FREE YEARS (PDFY) 1. Grade 1 - 5 group sessions of 2 hrs for parents on family management practices and preventing drug abuse (n=156) 2. Grade 5 - 5 group sessions of 2 hrs for parents on family management practices and preventing drug abuse (n=267) 3. Control - normal school curriculum and no parent training (n=220)	Grades 1-5 (break in intervention during grade 4)	Use of: Cigarettes Alcohol Marijuana Other drugs
Jackson 2003 [21] RCT Country: USA	887 families where one or more parent was a smoker. Children aged 8-9 yrs. Provider: project staff and trained support staff.	Tobacco	SMOKE-FREE KIDS 1. 5 anti-smoking modules posted home + telephone call from a health educator, a help-line number and a parent and child newsletter (n=441) 2. Control - fact based leaflets mailed to home. (n=446)	3 months	Intention to smoke
Loveland-Cherry 1999 [25] RCT Country:USA	892 children (aged 9-10 yrs.) and parents. Provider: community staff trained by project team.	Alcohol	1. 3 home based facilitator led sessions, information folder, telephone support calls and newsletter (n=90) 2. Control – standard school curriculum only (n=338)	3 years	Use of: alcohol
Storr 2002 [32] RCT Country:USA	678 children aged 5-6 yrs. Provider: teacher, school psychologist and social worker.	Tobacco	FAMILY-SCHOOL PARTNERSHI P 1. Classroom centred (n=230) 2. Family-school partnership including weekly school and home learning activities and workshops for parents (n=229) 3. Control – standard school curriculum (n=219)	1 year	Use of: tobacco
Transition					
Johnson 1990 [22] RCT Country USA	1,607 students aged 11-13 yrs. Provider: volunteer parents trained by project staff.	Drugs, alcohol and tobacco	Midwestern Prevention Programme 1. 10 session school programme with homework, parent programme, community programme and mass media coverage (n = n/g)*. 2. Control - community programme and mass media coverage (n = n/g)*.	3 months	Use of: cigarettes Alcohol Marijuana

Table of includes studies continued

Study ID and methods	Participants and provider	Focus and duration of intervention	Intervention	Duration of intervention	Main outcomes
Lochman 2002 [24] RCT Country:USA	245 children aged 10-12 yrs. Provider: school guidance counsellors and specialist project staff.	Drugs, alcohol and tobacco	COPING POWER PROGRAMME 1. Universal - development of behaviour management skills via training groups for teachers and parents; enhanced communication between school and home (n=62) 2. Indicated - group sessions for high risk children plus individual guidance sessions and parenting skills training (n=59) 3. Programmes 1&2 together (n=61) 4. Control - normal school curriculum (n=63)	16 months	Use of: Alcohol Tobacco Marijuana Delinquent behaviour
Park 2000 [26] RCT Country: USA	424 families. Average age of children 11 yrs. Provider: local volunteers trained by project staff	Alcohol	PREPARING FOR THE DRUG FREE YEARS (PFDY) 1. 5 group sessions of 2 hrs for parents on family management practices and preventing drug abuse (N=217). 2. Control - 4 booklets on adolescence sent to parents (n=151).	5 weeks	Use of: Alcohol
Pentz 1989 [35] CBA Country:USA	5065 students aged 11-13 yrs. Provider: teachers and student leaders	Drugs, alcohol and tobacco	PROJECT STAR 1. 10 class based sessions and 10 homework sessions to do with parents. Mass media coverage re project (n=3011). 2. Control - wait list with mass media coverage (n=2054)	10 weeks	Use of: Alcohol Tobacco Marijuana
Spoth 2001 [30] RCT Country: USA	446 families, children aged 11-12 yrs. Provider: trained volunteers	Alcohol Drugs Tobacco	PREPARING FOR THE DRUG FREE YEARS (PFDY)/ IOWA STRENGTHING FAMILIES PROGRAMME (ISFP) 1. PFTDFY - 5 group sessions of 2 hrs for parents on family management practices and preventing drug abuse (n=221) 2. ISFP - 7 group sessions involving 1 hr of separate sessions for parents and children, followed by family hr. Both sessions focused on family management and communication. Childrens' sessions also included peer relationships skills management (n=238) 3. Control - no intervention (n=208)	 5 weeks 7 weeks	Use of: Alcohol Marijuana Tobacco
Tang 1997 [37] CBA Country:Australia	3070 Children aged 11-12 yrs. Provider: info kit written by Quit campaign and Department of Education.	Tobacco	KICKBUTTS 1. 5 school based lessons, information kit to parents, quit telephone line, parenting workshop and community programme to prevent under age sales of tobacco (n=2016). 2. Control - standard school curriculum (n= 1009)	8 weeks	Use of: Tobacco
Werch 2003 [33] RCT Country: USA	650 children aged 11-12 yrs. Provider: School nurse	Alcohol	STARS FOR FAMILIES (Start Taking Alcohol Risks Seriously_ 1. Grade 6 - Interview with school nurse + 10 advice postcards sent to parents and Grade 7 interview with school nurse + classroom activities and homework projects to do with parents (n=250) 2. Control - booklet on alcohol use (n=157)	2 years	Use of: Alcohol

Table of included studies continued

Study ID and methods	Participants and provider	Focus and duration of intervention	Intervention	Duration of intervention	Main outcomes
Williams 2001 [34] RCT Country: Russia	1212 children aged 10-12 yrs. Provider: Class teachers trained by project team. Materials based on Project Northland.	Alcohol	RUSSIAN-AMERICA PARTNERSHIP FOR PREVENTION 1. 4 homework sessions, handbook to parents and poster fair at school (n=510 students, 544 parents). 2. Control - delayed intervention group (n=470 students, 534 parents)	1 year	Use of: Alcohol
Adolescence					
Bauman 2001 [19] RCT Country:USA	1198 parent/child pairs. Children aged 12-14 yrs. Provider: health educators trained by project staff	Alcohol and tobacco	1. Family Matters - booklet with parent-child activities + telephone advisor support. (n = 407) 2. Control - no intervention (n = n/g)*	?	Use of: Cigarettes Chewing tobacco Alcohol
Forman 1990 [20] RCT Country: USA	327 children average age 15 yrs. Provider: project staff	Drugs, alcohol and tobacco	Project SCOPE - Life skills training. 1. Coping skills training for students (10 sessions students) (n=91) 2. Coping skills training (10 sessions students, 5 sessions parents) (n=86) 3. Control - self awareness group for students - no parental participation (n=102)	10 weeks plus 2 booster sessions at 1 yr follow up	Use of: Cigarettes Alcohol Marijuana
Josendal 1998[23] RCT Country: Norway	4,011 students, average age 13 yrs. Provider: not disclosed	Tobacco	BEsmokeFREE 1. Class based curriculum with teacher training and parental involvement (n=1081) 2. Class based curriculum and parental involvement (n=1054) 3. Class based curriculum with teacher training (n=985) 4. Control - no intervention (n=891)	3 years	Use of: Cigarettes
Perry 2002 [27] RCT Country:USA	3151 students aged 11-13, 16-18 yrs. Provider: project staff	Alcohol	PROJECT NORTHLAND (from grade 6-11) 1. class curriculum, parent involvement, homework programme, peer leadership and community task force (n=1401) 2. Control: usual curriculum + no parent/community involvement (n=1549)	Phase 1 grades 6-9, phase 2 grades 11-12	Use of: Alcohol
Perry 2003 [28] RCT Country: USA	6728 students aged 12-13 yrs. Provider: Police and community workers trained by project staff.	Drugs, alcohol and tobacco	DARE PLUS PROJECT 1. DARE -10 school based sessions delivered by police - drug resistance/citizenship (n=1269) 2. Same as 1 plus homework to do with parents, drama project and behavioural advice post-cards sent to parents. 3. Control - delayed programme (n=1093)	2 years	Use of: Alcohol Tobacco Marijuana Other drugs

Table of included studies continued

Study ID and methods	Participants and provider	Focus and duration of intervention	Intervention	Duration of intervention	Main outcomes
Severson 1991 [29] RCT Country:USA	2552 students aged 12-14 yrs and 15-16 yrs. Provider: student peer leaders trained by project staff.	Cigarettes Smokeless tobacco	1. 3 mailed booklets to parents + 7 class sessions with peer leaders (n=782) 2. control - standard curriculum (n=1091)	3 weeks	Use of: Cigarettes Smokeless tobacco
Spoth 2002 [31] RCT Country: USA	1664 families, children aged 12-13 yrs. Provider: trained volunteers	Drugs, alcohol and tobacco	LIFE SKILLS TRAINING (LST) & IOWA STRENGTHEING FAMILIES PROGRAMME (ISFP) 1. LST only - 15 classroom sessions and 5 booster sessions (n=621) 2. Same as 1 + ISFP - 7 group sessions involving 1 hr of separate sessions for parents and children, followed by family hr. Both sessions focused on family management and communication. Childrens' sessions also included peer relationships skills management (n=549) 3. Control - standard school curriculum (n=494)	2 years	Use of: Alcohol Tobacco Marijuana
Stevens 1996 [36] CBA Country:USA	1200 children aged 10-15 yrs. Provider: teachers and community volunteers trained by project staff.	Drugs Smokeless tobacco	NEW HAMPSHIRE STUDY - Here's looking at you 2000 1. School based curriculum (30 hours) (n=619) 2. Same as 1 + community program including 10 session parent communication course (n=305) 3. Control - no intervention (n=276)	1 year	Use of: Marijuana Smokeless tobacco

Numbers not given (n = n/g)*

Table II Quality assessment information RCTs

Study ID	Allocation concealment *	Baseline data for primary outcome	Adequate follow up at final assessment (80% or more followed up)	Blinded assessment of primary outcome	Unit of allocation and analysis the same	Contamination risk	Intention to treat	Length of follow up (post intervention)
Bauman 2001	A	Yes	Yes (77%)	Yes	Yes	No	Yes	1 yr
Forman 1990	B	Yes	No (72%)	No	No	No	No	1 yr
Jackson 2003	B	Yes	No (64%)	Yes	No	No	Yes	2 yrs
Johnson 1990	B	Yes	Yes (84%)	Unclear	Yes	No	Yes	3 yrs
Josendal 1998	A	Yes	Yes (93%)	Unclear	No	No	Yes	1 yr
Lochman 2002	A	Yes	Yes (83%)	Yes	No	Yes	Yes	1 yr
Loveland-Cherry 1999	B	Yes	Yes (81%)	Unclear	Yes	No	Yes	1 yr
Park 2000	B	Yes	No (70%)	Yes	No	No	Yes	3.5 yrs
Perry 2002	B	Yes	No (67.8%)	Unclear	Yes	No	Unclear	6 yrs
Perry 2003	B	Yes	Yes (84%)	Unclear	No	No	Yes	1.5 yrs
Severson 1991	B	Yes	No (69 %)	Unclear	No	No	Yes	1 yr
Spoth 2001	B	Yes	No (67%)	Yes	No	No	Yes	2 yrs
Spoth 2002	B	Yes	Yes (82%)	Yes	No	No	Yes	2 yrs
Storr 2002	B	No (not appropriate)	Yes (81%)	Yes	Yes	Yes	Yes	6 yrs
Werch 2003	B	Yes	No (78%)	Unclear	Yes	Yes	Yes	1 yr
Williams 2001	B	Yes	Yes (81%)	Yes	No	No	Yes	1 yr

* A = adequate, B = unclear, C = inadequate

Table III Quality assessment non RCTs

Study ID	Baseline data for primary outcome	Blinded assessment of primary outcome	Adequate follow up	Unit of allocation and analysis the same	Appropriate control
Hawkins 1999	No (N/A)	Unclear	Yes	No	Matched
Pentz 1989	Yes	Yes	Yes	No	Matched
Stevens 1996	Yes	Yes	Yes	Yes	Matched
Tang 1997	Yes	Unclear	Unclear	No	Matched

Table IV Summary of results - Effect of parenting intervention versus control

Study	Alcohol	Drugs	Smoking	Other	Overall quality score
Primary School					
Hawkins 1999	No difference	No difference	No difference	Better academic achievement, less school misbehaviour*	2/5
Jackson 2003	Not measured	Not measured	Reduced*		4/7
Loveland-cherry 99	Reduced* if no prior use but increase* if already started drinking at time of intervention.	Not measured	Not measured		5/7
Storr 2002	Not measured	Not measured	Reduced*		4/7
Transition					
Lochman 2002	Reduced*	Reduced*	Reduced*	Delinquent behaviour reduced	5/7
Johnson 1990	Reduced	Reduced*	Reduced*		5/7
Park 2000	Reduced*	Not measured	Not measured		4/7
Pentz 1989	Reduced*	Reduced*	Reduced*		4/5
Spoth 2001	Reduced*	Reduced*	Reduced*		4/7
Tang 1997	Not measured	Not measured	No difference		2/5
Werch 2003	Reduced (but only significant in Magnet schools)	Not measured	Not measured		3/7
Williams 2001	Reduced	Not measured	Not measured		5/7
Adolescents					
Bauman 2001	No difference	Not measured	Reduced*		7/7
Foreman 1990	Increased	No difference	No difference		2/7
Josendal 1998	Not measured	Not measured	Reduced*		5/7
Perry 2002	Reduced*	Not measured	Not measured		3/7
Perry 2003	Reduced (only significant in boys)	Reduced (only significant in boys)	Reduced (only significant in boys)		3/7
Spoth 2002	Reduced*	Reduced*	Reduced*		5/7
Stevens 1996	Not measured	No difference	Not measured		5/5
Severson 1991	Not measured	Not measured	Increased*	Reduction in children using smokeless tobacco*	3/7

* = result statistically significant